Series division method based on PSO and FA to optimize Long-Term Hydro Generation Scheduling

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ABSTRACT

The fundamental requirement of power system hydro scheduling is to determine the optimal amount of generated powers for the hydro unit of the system in the scheduling horizon of 1 year or few years while satisfying the constraints of the hydroelectric system. Long-Term Hydro Generation Scheduling (LHGS) is a complicated nonlinear, non-convex and nonsmooth optimization problem with discontinuous solution space. The model considers daily water inflows, limits on reservoir level, power generation depends on the available head of hydro units caused by power variations, start-up, and shut-down of hydro units. To deal with this complicated problem, Series division method (SDM) based on the practical swarm optimization and the firefly algorithm is proposed in this paper. The SDM is to make a division on the Swarm Intelligence (SI) algorithm which is to be a number of particles searching collections that properly can be regarded as divisions. Whereas, each division is a developmental algorithm which used to get the global point. The extent of the SDM is often offered a quicker convergence so as to accomplish the best initial operation to swarm's algorithm research. The proposed SDM are tested on two test systems actual observed system operator (AOSO) and Standard System Operation (SSO) and compared with some recent research works in the area. The results point out the Series Division Firefly Algorithm (SDFA) is robust and has good efficiency and superiority.

KEYWORDS: Himreen Lake Dam; Series division method; Long-Term Hydro Generation Scheduling

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